Kenya
STATE OF THE CITIES

MALINDI

WORLD BANK GROUP

KENYA STATE OF THE CITIES BASELINE SURVEY
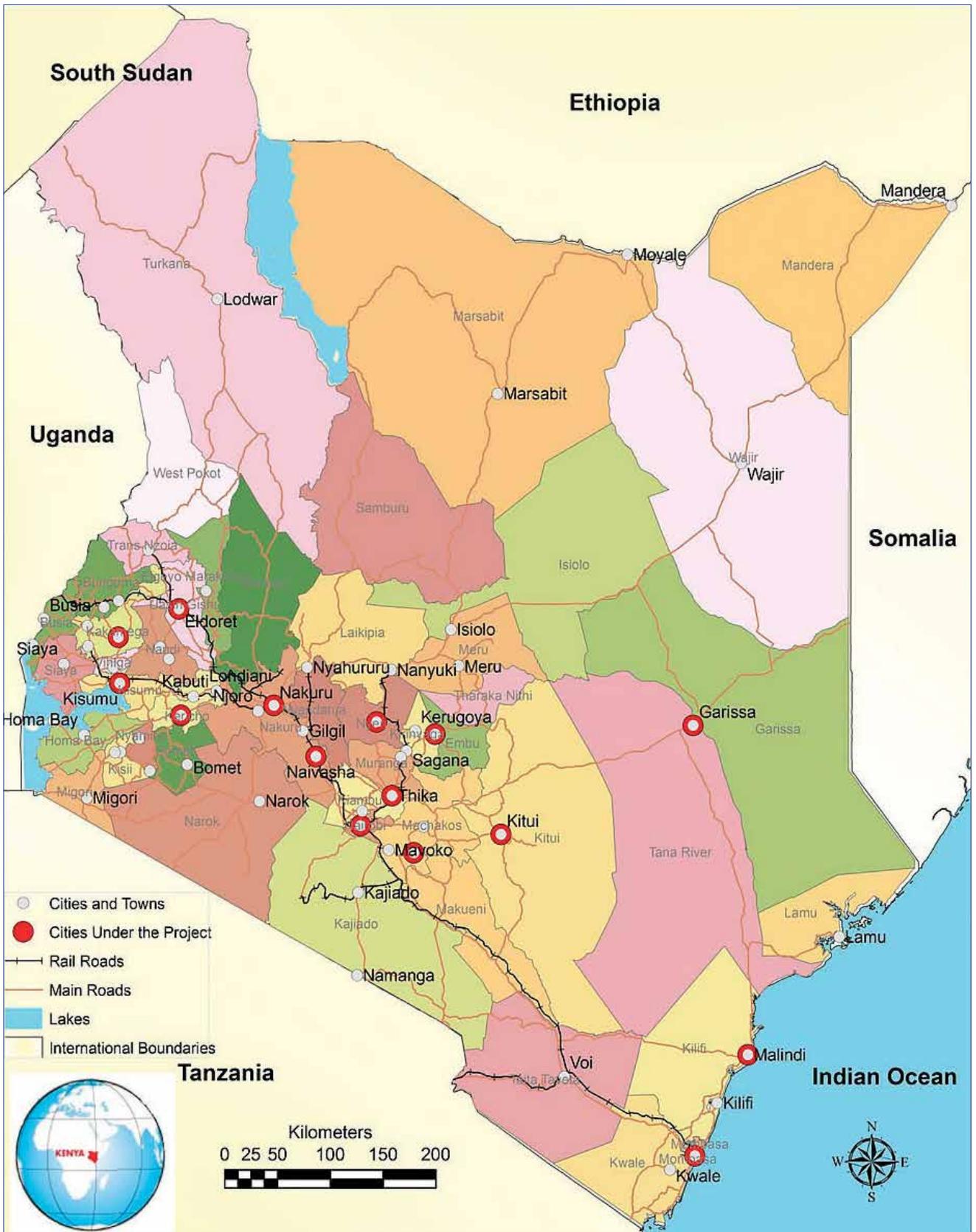
STATISTICAL ABSTRACT FOR MALINDI, KENYA

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ABBREVIATIONS

CAPI	Computer Assisted Personal Interview
EA	Enumeration Area
GOK	Government of Kenya
HH	Household
HUD	U.S. Department of Housing and Urban Development
KIHBS	Kenya Integrated Household Budget Survey
KISIP	Kenya Informal Settlements Improvement Program
KMP	Kenya Municipal Program
KNBS	Kenya National Bureau of Statistics
NMSP	Nairobi Municipal Service Project
PDA	Personal Digital Assistant, in this case a hand held computer used by interviewers
PSU	Primary Sampling Unit
SMSA	Standard Metropolitan Statistical Area
SRS	Simple Random Sample
SSU	Secondary Sampling Unit
WB	World Bank
WBG	World Bank Group

ACKNOWLEDGEMENTS

INTRODUCTION

Background

The Kenyan government, with the support of development partners, is increasing its investments in urban infrastructure and services. To support these efforts, the World Bank contracted NORC at the University of Chicago to carry out a baseline study of the demographic, infrastructure, and economic profiles of fifteen Kenyan towns and cities: Nairobi City, Mombasa, Naivasha, Nakuru, Malindi, Eldoret, Garissa, Embu, Kitui, Kericho, Thika, Kakamega, Kisumu, Machakos, and Nyeri. This was undertaken in order to deepen understanding of the cities' growth dynamics, and to identify specific challenges to quality of life for residents. The study, called the "Kenya State of the Cities Baseline Survey," collects and analyzes household survey data to produce key statistics and identify differences in conditions among types of households-especially differences between those living in informal versus formal settlements. The ultimate goal is to use the information to establish development priorities for infrastructure and service investments and, eventually, to track the effectiveness of these investments.

Prior to the State of the Cities survey, there were little data available to support the design of programs to improve infrastructure and related services in most Kenyan cities. While there have been several household surveys of Nairobi's informal settlements and numerous analyses using the data, few surveys or analyses have been carried out in other Kenyan towns and cities or for modest-income areas in Nairobi.

To facilitate access to the rich datasets generated by the survey, three written products were commissioned: a Statistical Abstract (such as this one) for each city, a City-at-a-Glance for each city (a two-page summary of the Abstract), and an Overview Report (a more comprehensive discussion of the topics in this Introduction, a topic-by-topic comparative analysis of the fifteen cities, and appendices with the survey instrument). The Abstract's objective is to provide comprehensive but easily accessible information on the wide range of municipal conditions covered in the survey, as reported by households. Some information in the Abstract also comes from secondary sources, such as the national Census and the Kenya Integrated Household Budget Survey (KIHBS). The primary audience for the Abstract includes policy makers, development practitioners, development partners, civil society organizations, and urban residents. Better planning and more productive investments can result from exploiting the information in each city's Abstract.

Methodology

For this baseline household survey, NORC used a two- and three-stage, stratified, cluster sampling design intended to be representative of poor and non-poor households living in formal and informal settlements in the fifteen cities included in the study. The first-stage sampling frame was based on Kenya's 2009 census frame of Enumeration Areas (EAs). In the census sample frame, EAs are identified as urban, peri-urban or rural. EAs are further identified as containing formal or informal settlement types. For the first stage sampling, NORC selected EAs from strata identified as informal (slum), urban-formal, peri-urban-formal and rural. In cases where the EAs were "large" (200 to 700 households) these EAs were divided in half, thirds, or quarters and one segment was randomly selected.

For the final stage of sampling, NORC carried out a full household listing in each selected EA (or segment, as the case may be) and randomly selected ten households for interviewing.[1] Because expected response rates were unknown prior to data collection, interviewers were given a target to complete at least seven interviews in each EA. In Malindi, 143 EAs were selected in the first stage. In the second stage, a total of 8,235 households were listed and 1,442 households were selected.

The data for this report are based on 1,026 completed interviews carried out in Malindi from November 12, 2012 to February 28, 2013 by a team of four interviewers and one supervisor. Among eligible households,[2] the completion rate was 71.15 percent.[3] Data collection took place in both formal and informal settlements simultaneously; 136 interviews were completed in informal settlements and 890 were completed in formal settlements.

Questionnaire

The Kenya State of the Cities baseline questionnaire was developed iteratively using a base set of questions developed by the World Bank and refined to capture the key variables related to infrastructure access and municipal services of interest to the Kenyan government. The final fielded questionnaire is available in Volume II of the Overview Report. Both the household listing form and the questionnaire were programmed for use as a Computer-Assisted Personal Interview (CAPI) and both were carried out using tablet computers which transmitted data to project servers via the mobile phone network. Interviewers captured GPS coordinates during listing and again at the end of each interview.

Data Quality

Recorded administration time of the CAPI instrument showed a median duration of 20 minutes in Malindi (21 minutes across all municipalities). However, duration values may have been compromised by transmission problems and supervisor reviews, which may have overwritten timestamps. Despite the uncertainty of exact durations, data quality measures do not show systematic interviewer-related errors in the final data. Approximately a third of all interviews under-went validation, including call-backs by supervisors or central office staff (in-person and by phone).

Table Presentation

Each city's Abstract includes a set of tables designed to provide basic information on households' economic and demographic conditions, their housing conditions, and access to infrastructure and services. One challenge in preparing the Abstract was to provide a complete picture of conditions while still being selective in the information presented so as not to overwhelm the reader. A second challenge was to display the information in a way that permits stakeholders to understand conditions faced by different population groups.

To meet these challenges we have developed a set of tables with items believed to be most important for stakeholders and have broken down the items in several ways. In addition to providing an overall picture of household (HH) characteristics, the tables illustrate whether household characteristics differ by key factors. The rows of each table generally list the household characteristics (e.g., size of household, percentage of children in school). The columns present statistics for the entire city, then show how the data differs by

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[1]   A complete description of the sampling design is found in "Kenya Municipal Program State of Cities: Overview Report," NORC, June 2013.

[2]   Eligible households are defined as occupied dwellings with at least one resident age 18 or older who is present during the field period.

[3]   The completion rate is the number of households that successfully completed an interview over the total number of households assigned.

location (informal vs. formal areas), household poverty status (poor vs. non-poor), gender of the head of household (male vs. female headed, for informal areas only), as well as other factors pertinent to the particular table.[4]

From each table, one can quickly observe if there are large differences in household characteristics by location, spending power, etc., simply by comparing the cells (numbers). Each table also shows whether the observed differences are statistically significant.[5] "Statistically significant" means that statistical analysis has revealed that a difference, no matter how small or large, is unlikely due to chance or randomness. In practice, statistically significant differences are the ones researchers are interested in-they can be interpreted as telling us about meaningful differences in household characteristics by location, spending power, gender, or other category. When we discuss differences in the text of this report, we will refer to "statistically significant" differences unless otherwise noted.

In terms of policy decisions, whether differences matter is a combination of whether they are statistically significant and how large the differences are. Ultimately, it is up to the policy practitioner to decide how large a difference must be to matter in the context of interest. An important note when interpreting results is that statistical significance does not imply causality. In other words, if differences in values are statistically significant, this does not mean that one variable caused a change in the other variable. Another factor may be influencing both variables; for example, for we may find a "significant" difference between head-of-household education and household poverty, perhaps the key common cause is social status, which affects both their educational attainment and job/spending opportunities. Additionally, where a statistically significant difference is identified it does not imply the direction of the relationship. Perhaps the household poverty is the reason for the different education levels, or vice-versa. In this report, therefore, we will say a household characteristic is "associated with" or "correlated" with certain factors, rather than saying one is caused by another.

In order not to clutter the tables yet provide the reader with the maximum information, we mark statistically significant results in the tables with bold (for two adjacent values in the same row) and italics (to compare adjacent columns of data). Underlined values denote an insufficient number of household responses for some enumeration category of the sampling design to perform a test of statistical significance. The number of observations for a particular variable is noted in the tables in rows denoted by "N". Cells with no observations are indicated with hyphens (-).[6] Table 1, below, summarizes the formatting used in tables throughout the Abstract: A value that is both bold and italicized indicates statistically significant differences for two adjacent cells (i.e., values in the same row) as well as for the distributions between adjacent columns. In contrast, a value in standard font-no bolding, italics, or underlining-still means that a significance test was performed but that the values under comparison were not statistically significantly different from each other.

There is one caveat to the formatting rules that must be addressed regarding the significance testing of distributions. While the absence of italics sometimes means that the distribution was tested and was not found to be statistically significant, this is often not the case – i.e., there are many distributions which were not tested for significance. To avoid confusion, the comprehensive list of distributions which were tested for significance follow.

- **Table B.2a:** Expenditure ranges by location, tenure, water connection, business, skilled/unskilled head, and gender of household head (in informal areas)
- **Table B.2b:** Income ranges by location, tenure, water connection, business, skilled/unskilled head, and gender of household head (in informal areas)
- **Table C.3:** Distribution of home value ranges and rent ranges by location, tenure, water connection, business, skilled/unskilled head, and gender of household head (in informal areas)
- **Table D.1a:** Percent of households with a piped water connection inside their dwelling by security of ownership; percent of households with a piped water connection inside their compound by security of ownership; percent of households close to piped water access by security of ownership; cost of water by security of ownership; most important water source by security of ownership; reasons for no connection by security of ownership
- **Table D1.b:** Water source by water quality; water provider by water quality; water treatment buy water quality; treatment methods by water quality.

Table 1: Description of formats used to denote statistical significance

Format	When we use it	Example
Bold	Two bolded values in the same row next to each other indicate that the difference is statistically significant. We also use bold for 'Yes' or 'No' variables. If bold, it means that the difference between the mean of households that answered 'yes' (displayed) and the mean of those that answered 'no' (not displayed) is statistically significant.[a]	Table A.1 displays the mean household size for households located in formal and informal settlements; if the pair of values is bold, it means that the difference in household sizes between formal and informal areas is statistically significant. Table B.2 displays the proportion of households which own land (or have tenure) that fall below the poverty line. If bold, it means that this proportion is statistically significantly different from the proportion of households which do not own land that fall below the poverty line.
Italics	We indicate statistically significant differences between columns of three or more cells using italics; this means the difference between the entire distributions (columns) is statistically significant.[b]	Table B.2, Monthly household spending power, displays the distribution of households across income and expense ranges. If values appear italicized in both columns for households located in formal and informal settlements, the difference between the two distributions is statistically significant.
<u>Underline</u>	Denotes values where, due to lack of data at the census tract (enumeration area, or EA) level, it was not statistically possible to conduct the significance test.[c]	Table B.3 shows the mean value of households' primary residence with and without land, and of any other residence and/or land. An underlined value means that due to lack of data at the census tract level, it is not possible to perform a test for significant differences.
Hyphen (-)	In cases where there are no data for a cell at all, we note that with a hyphen (-).	Table B.3 shows data related to household finance. For the percentages of households according to source of financing, the cells that display a hyphen means that there were no observations for that particular variable and category.

a. *Here a p-test from an Adjusted Wald test is conducted.*
b. *Here Pearson's Chi-squared test is conducted.*
c. *At least two households are required to compute a household-level variance, which is required to conduct a hypothesis test. Note that this does not imply that the respective table values are based on just one household or even just one EA.*

Another feature of the data worth mentioning is that outliers (responses that are very different from all the others) were not a major issue in the survey data, affecting just three variables in any important way.[7]

Finally, note that in tables presenting a distribution of responses, if some response categories are left out then the distribution will not add up to 100%. In cases where all response categories are listed then the first row of responses is given as 100. Unless otherwise noted, all figures presented in the tables are percentages.

The core of this abstract comprises a set of tables divided into chapters. Each chapter contains a textual summary of each table and highlights some of their implications. The tables are divided into four groups:

A. Household characteristics – 3 tables
B. Economic profile – 5 tables
C. Tenure, tenure security, dwelling characteristics – 4 tables
D. Infrastructure services – 7 tables

Notes to the tables are identified by small letters appearing as superscripts at the end of each table. All tables present weighted figures at the household level, unless otherwise noted, to reflect the total population of the respective table cell. The N values, however, present the unweighted number of households, unless otherwise noted.

The final chapter of this abstract contains a series of three "Development Polygons". These complement the detailed tables presented in sections A through D by illustrating an "overall" sense of the state of the city. The figures included are the Development Diamond, the Infrastructure Polygon, and the Living Conditions Diamond.[8]

While the tables generally have a common set of column headings, there is some variation. The following are definitions for those headings that require clarification:

- *Informal/Formal Areas* – This distinguishes between areas based on whether most households in the area have property title and official services. It is a designation provided by a status code at the level of the EA (Enumeration area) as used by the National Census.

- *Gender (Informal)* – For the households living in the locations coded as "Informal," data for household characteristics are provided for both male- and female-headed households. As is standard, the male-headed households may contain the spouse while female-headed households do not.

- *Class (of durable)* – Durable assets are a standard measure of household wealth. They are grouped into three classes, roughly based on their likely market value and degree of permanence. The actual items in each class are indicated in the table. The values reported for these categories are the number owned by the household, not their average or total value.

- *Spending Power* – The total value of household expenditures collected by the survey, excluding rent or mortgage payments.

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7   Across all fifteen towns and cities these were: (i) home value, in which 20 responses were reported in millions units instead of as the value itself (so we simply divided these responses by a million); (ii) 40 respondents reported travel time for a weekly or monthly commute rather than a daily commute (these over-eight-hours responses were dropped); (iii) we removed one case in which the time to get water was over a week.

8   The basic format for all three figures appear in the World Bank Policy Research Working Paper, "Poverty, Living Conditions, and Infrastructure Access" A Comparison of Slums in Dakar, Johannesburg, and Nairobi" by Sumila Gulyani, Debabrata Talukdar, and Darby Jack (2010). We strived to make our own figures as similar as possible, though some deviations, noted in the accompanying text, were necessary.

- *Access to Infrastructure* – This indicator combines six categories of infrastructure (divided into 13 subcategories) weighted by importance to the household and summed to create a household indicator from 0 to 9.5. See NORC (August 2013), "Kenya Municipal Program State of the Cities: Overview Report" for a more detailed description.

- *Household Poverty* – The poverty line varies depending on the number of members of the household and their age. It is calculated by adding together:

  - 5,567 KSh per month for each adult 15 years and older in household,
  - 3,619 KSh per month for each child aged 5 to 14 in household,
  - 1,336 KSh per month for each child under 5 years old in household.

This section presents basic household characteristics. Table A.1 provides information on household size and household member distribution by age category. Table A.2 details the level of education of the members of household, as well as the proportion of children and adults of different ages who were currently in school at the time of the survey. Finally, Table A.3 presents household health characteristics, including the proportion of children under 15 who have received the BCG vaccine (an immunization against tuberculosis), a major public health concern given that Kenya is a high-tuberculosis-burden country.[9] Table A.3 also includes the number of household members with an illness or injury in the two weeks prior to the survey, the proportion of those members who visited a health practitioner, average household medical expenditures for the month preceding the survey, and the percentage of households that have health insurance. All of these figures are given comprehensively and broken down by location type, the household's poverty status, and the gender of head of household (among informal areas).

A.1 Household Demographic Composition

The 2009 census estimated that the municipality of Malindi had a population of 118,265, being the only city in the sample whose population did not increase over the figure reported in the 1999 census; this represents a negative annualized average growth rate of 0.01%.[10]

The average household size in Malindi, as reported by survey respondents, is 3.1 members. On average, about 87.2% of households' members are aged 5 to 60 years old – 12.9% are between 5 and 14 years old, 74.3% are between 15 and 60, 11.8% are under 5 and less than 1% are over 60. Differences in age composition between poor and non-poor households are statistically significant; whereas a larger proportion of individuals less than 15 years old live in poor households, non-poor households register a larger proportion of adults among their members. The head of household is female in 20% of all households. Ninety-six percent of female-headed households are located in formal areas, and 64% of female-headed households are poor, i.e. given their household size they have monthly expenditures below the poverty line.

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[9]   World Health Organization Global tuberculosis report 2012, retrieved June 12th 2013 from http://www.who.int/tb/publications/global_report/en/

[10] From Statistical Abstract 2010 and Statistical Abstract 2006, Kenya National Bureau of Statistics.

Table A.1: Household demographic characteristics

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Number of households:							
Weighted	35,821	1,237	34,584	24,454	11,296	935	263
N (unweighted)	1,014	136	890	664	359	104	28
Size of household	3.09	3.23	3.08	3.41	2.38	3.30	2.60
N	1,026	136	890	664	359	104	28
Mean percent of household members aged:							
Total	100	100	100	100	100	100	100
Under 5	11.8	12.9	11.7	13.9	7.1	12.8	13.5
5 to 14	12.9	15.4	12.8	14.6	9.3	14.6	15.4
15 to 60	74.3	71.0	74.4	70.6	82.3	72.0	69.7
Over 60	1.0	0.7	1.0	0.9	1.2	0.5	1.4
N	1,026	136	890	664	359	104	28
Proportion of households…							
Male-headed	80	78	81	82	78		
Female-headed	20	22	19	18	22		
N	1,011	132	879	654	354		
Female-headed distribution		4	96	64	36		
N		228	228				

A.2 Household Education Characteristics

Malindi was part of Coast Province, where in 2009 primary classrooms had an average class size of 40 students and secondary classrooms had on average 34 students. Student-teacher ratios in the former Coast Province were, on average, 68:2 for primary schools and 23:6 for secondary schools.[11]

The first panel of Table A.2 presents statistics on the education of all individuals aged 5 years and older within the surveyed households. About 22% of all individuals have completed secondary school or higher-a figure that is likely skewed by the fact that the majority of household members are between 15 and 60 years old-and 55% completed primary or higher. A significantly higher percentage of poor-household members had some primary school than did those who live in non-poor households; on the other hand, significantly more members from non-poor households completed secondary education and more (35% vs. 17% for poor households). Six percent individuals from all households reported having "no education", and the distribution across categories is quite even, with no statistically significant differences.

The second panel of the table shows the mean percent of adult individuals over 18 years within each household. This is done to show intra-household educational levels among households' adult members. We find that on average, 31.5% of a Malindi household's adults have completed secondary school or higher (23.5% completed secondary, while 8% completed higher education). On average, 7% of a household's adults had no education whatsoever. The remaining 61% completed some primary, all of primary, or some secondary schooling. We also found interesting differences between households in formal and informal areas and

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[11] Provinces no longer exist in Kenya. This data is based on the Kenyan Institute for Public Policy Research and Analysis 2009 Economic Report, Table A3.16, pg. 192, per Ministry of Education statistics, http://www.marsgroupkenya.org/pdfs/2009/10/Kenya_Economic_Report_2009.pdf Section

between poor and no-poor households. In informal areas, a significantly lower percentage of household's adults completed higher education than in formal areas (2.7% vs. 8.2%). In poor areas, a significantly higher percent of households' adults had no education (8.4%, versus 4.4% in non-poor areas) and registered some primary education (23% vs. 9.2% of non-poor households). In contrast, a considerably larger proportion of adults from non-poor households completed secondary education than higher education (47.3% vs. 24.1% of adults from poor households).

Ninety-six percent of individuals aged 5 to 14 years old are currently in school; this figure is 57.7% for individuals 15 to 18 and only 3.8% for individuals over 18. The percentage of individuals over 18 that are currently in school is significantly higher among households in formal areas than in informal settlements (3.9% vs. 0.6%).

Table A.2: Household education characteristics

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of individuals 5 and older with highest grade completed:							
Total	100	100	100	100	100	100	100
None	6	5	6	7	5	6	5
Some primary	38	43	38	**42**	**25**	41	42
Completed primary	26	26	26	27	26	28	26
Some secondary	7	7	7	7	8	5	8
Completed secondary	16	17	16	**14**	**23**	19	15
Higher	6	2	6	**3**	**12**	1	3
N	2,607	358	2,249	1833	765	279	59
Mean percent of household's adults over 18 with highest grade completed:							
Total	100	100	100	100	100	100	100
None	7.1	7.5	7.1	**8.4**	**4.4**	8.0	6.7
Some primary	18.6	17.6	18.6	**23.0**	**9.2**	16.3	15.7
Completed primary	34.6	36.4	34.6	35.8	32.3	36.1	40.1
Some secondary	7.9	7.0	8.0	8.6	6.5	6.5	8.6
Completed secondary	23.5	28.7	23.3	**19.7**	**31.5**	30.9	23.9
Higher	8.0	**2.7**	**8.2**	**4.4**	**15.8**	2.2	4.9
N	1,025	136	889	663	359	104	28
Percent of individuals in school by age group:							
5 to 14	96.4	<u>88.5</u>	<u>96.7</u>	<u>96.6</u>	<u>95.9</u>	<u>92.5</u>	<u>86.9</u>
N	355	<u>52</u>	<u>303</u>	<u>260</u>	<u>95</u>	<u>37</u>	<u>11</u>
15 to 18	57.7	<u>63.6</u>	<u>57.5</u>	<u>53.7</u>	<u>73.2</u>	<u>49.8</u>	<u>100.0</u>
N	132	14	118	94	36	9	3
Over 18	3.8	**0.6**	**3.9**	3.4	4.7	0.9	0.0
N	1,024	136	888	662	359	104	28

A.3 Household Health Profile

Malindi was part of Coast Province, which in 2005 had an average of 10 doctors and clinical officers per 100,000 residents and 44 nurses per 100,000 residents.[12] The former Coast Province had 23 medical facilities per 100,000 residents, including hospitals, clinics, dispensaries, and other types of facilities.[13]

Overall, 99% of households' report their children under 15 have received BCG (tuberculosis) immunizations. Twenty-two percent of households had a sick or injured household member in the two weeks prior to the interview, a number which is significantly higher among households in formal than in informal areas. Eighty-one percent of these visited a health practitioner. Rates of health insurance coverage are extremely low (6%), and vary significantly by area type (6% in formal areas vs. 2% in informal areas).

Table A.3: Household health characteristics

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of household's children under 15 having received BCG immunization	99	98	99	99	97	98	100
N	559	80	479	412	146	61	15
Percent of households with an injured/ill member, previous two weeks	22	15	22	24	19	11	19
N	1,026	136	890	664	359	104	28
Percent of ill household members that visit a health practitioner, previous two weeks	81	78	81	78	87	93	70
N	214	19	195	146	68	12	5
Household medical expenditures (KSh), previous month	288	210	291	196	489	252	93
N	1,025	136	889	663	359	104	28
Percent of households with health insurance	6	2	6	6	6	1	4
N	1,024	136	888	663	358	104	28

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[12] 2004/2005 numbers of healthcare providers obtained from Partners for Health Reformplus 2006 Report, Table A1, pg. 39, Annex A, statistics obtained from Rep. of Kenya. www.healthsystems2020.org/files/1654_file_Tech101_fin.pdf. Per capita figures calculated by dividing by 2005 (estimated) population obtained from the Kenya Integrated Household Budget Survey, Table 3.1, http://www.knbs.or.ke/pdf/Basic%20Report%20(Revised%20Edition).pdf.

[13] Based on most current (undated) figures from Kenya Bureau of Statistics Open Kenya online database, https://kenya.socrata.com/Health-Sector/Health-Facility-Pie-Chart/yre4-763w. Per capita figures calculated by dividing by 2009 census population, obtained from 2010 Statistical Abstract, Kenya National Bureau of Statistics.

HOUSEHOLD ECONOMIC PROFILE

B.1 Household Occupational Composition

Table B.1 presents the current occupation, or main activity, of household members. The first panel shows the percent of all adults over 18 in each of the occupations. The five most prominent occupation categories are casual employee, homemaker, regular employee, self-employed, and student, which together comprise about 83% of all adults in Malindi over 18 years old. Individuals in formal areas are significantly more likely to be regular employees than individuals in informal areas, and are significantly less likely to be casual employees. Individuals in poor households are significantly less likely to be regular employees or self-employed, while they are significantly more likely to be casually employed and homemakers. The proportion of sick or unable-to-work individuals among poor households is 10 times as large as it is among non-poor households (1% vs. 0.1%). One interesting and statistically significant finding is that members of female-headed households in informal areas are considerably more likely to be students than members of male-headed households. Individuals in female-headed households in informal areas are also significantly more likely to be unemployed and looking for a job than individuals in male-headed households in these areas.

The second panel shows the average percent of adults over 18 within each household that are occupied in each of the categories. This is done to show intra-household occupational status among households' adult members. The results here are similar to those in the first panel above. Here, we find that on average, about two-thirds (60.6%) of a household's adult members are either regular employees, casual employees, or self-employed. About 21% are homemakers, 4.7% are unemployed but looking for work, and 3.2% are students; no other category includes more than 2.5% of adult household members. Our survey found no differences regarding household location; however, there are significant differences between poor and non-poor households. Similar to the first-panel data, poor households contain, on average, a significantly higher percentage of adults who are homemakers and a significantly lower percent who are regular employees, self-employed and students. In informal areas, male-headed households contain significantly higher average percentages of adults who are homemakers, but a significantly lower percentage who are students. In female-headed households in informal areas, an average of about 17.4% percent of the adult members is unemployed and looking for a job, compared to just 2.6% of individuals in male-headed households.

Table B.1: Household members' main activity

Occupation[a]	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of adults over 18 with occupation:							
Employer	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regular employee	12.3	7.1	12.5	10.3	17.4	8.1	2.9
Casual employee	36.2	47.1	35.9	38.9	29.9	49.4	43.3
Self-employed	5.5	4.8	5.6	4.1	9.0	4.3	4.0
Unpaid family worker	0.2	0.0	0.2	0.2	0.4	0.0	0.0
Apprentice	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Student	4.7	2.9	4.8	4.4	5.5	1.4	10.0
Pensioner/investor	2.5	3.0	2.5	2.7	2.2	2.7	4.9
Earning from investments/ property	1.2	0.0	1.2	0.8	2.0	0.0	0.0
Sick/unable to work	0.8	0.3	0.8	1.0	0.1	0.0	1.8
Unemployed looking for work	5.3	6.0	5.3	5.7	4.1	3.8	17.1
Unemployed, not looking for work now	3.0	2.9	3.0	2.5	4.0	2.8	4.1
Homemaker	24.2	25.5	24.2	25.7	20.5	27.4	10.0
N	1,881	244	1,637	1,274	599	194	41
Mean percent of household's adults over 18 with occupation: [b]							
Employer	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regular employee	11.9	7.1	12.1	9.4	17.3	7.8	4.2
Casual employee	42.8	53.8	42.4	45.7	36.9	55.4	53.0
Self-employed	5.9	4.2	6.0	4.1	9.6	3.7	3.6
Unpaid family worker	0.1	0.0	0.1	0.1	0.1	0.0	0.0
Apprentice	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Student	3.2	1.5	3.3	2.6	4.5	0.7	4.5
Pensioner/investor	2.1	3.0	2.0	2.1	1.9	3.0	3.7
Earning from investments/ property	1.1	0.0	1.2	0.9	1.6	0.0	0.0
Sick/unable to work	0.4	0.1	0.4	0.5	0.0	0.0	0.7
Unemployed looking for work	4.7	5.7	4.7	5.5	3.2	2.6	17.4
Unemployed, not looking for work now	2.3	2.3	2.3	1.8	3.3	2.5	2.0
Homemaker	21.0	22.1	21.0	23.4	16.1	24.3	10.0
N	1,025	136	889	663	359	104	28

Notes:
a. The category "Other" has been omitted.
b. These numbers are obtained by first computing the percentages of each household's members in each category, and then taking the mean of these percentages over all households.

B.2 Household Income/Expenditure Levels

There are two general approaches to measure spending power: expenditure and income, both of which are shown in the tables below. In the survey, income derives from household members' salaries, business earnings, rents, public cash support, and earnings from financial assets in the month prior to the interview, but does not include any remittances. Expenditures include all purchases, including investments for household-owned businesses. In theory, both approaches express the same amount of spending power, but typically one approach is not enough, especially when estimations are based on survey data. This is because survey respondents' perceptions about their income and expenditures can be unreliable; estimates vary depending on seasonal changes in economic activities, type of assets owned, household's cash flows, and in-kind payments.

In practice, the expenditure approach is usually more accurate because most respondents, making purchases daily, recall their expenses better. Income, on the one hand, can be problematic because it can be subject to respondent misreporting (e.g., desire to impress the enumerator) and, with non-wage income; respondents do not generally make a clear distinction between revenue (sales) and income (revenue minus expenses). Using both methods, therefore, provides an additional level of verification.

Over half (68%) of all households have monthly expenditures below the poverty line, as determined by the household composition. This proportion is higher in informal areas (68% vs. 77% of households in informal settlements), and households with water connections are less likely to be below the poverty line (47%) than those without.

Income and expenditure distributions vary significantly depending water connection, business ownership, and whether the household head is skilled (income only). Whether a household has a water connection or owns a business are particularly strong predictors of income and expenditure levels—households with a business and with a water connection are more likely to fall into the highest income/expenditure categories and significantly less likely to be below the poverty line. In informal areas, the only statistically significant difference between households headed by females or males is the proportion of households with incomes below 3,000 KSh (21% of female-headed households vs. only 5% of male-headed ones).

On average, households who sent money to individuals outside their household sent around 4,230 KSh in the three months prior to the interview, and those that received money received, on average, almost 15,212 KSh in the same period. Households are more likely to send money than to receive it, and wealthier households are much more likely to send money—67% of households in the second-top expenditure category send money to friends or relatives, compared to only 9% of those in the second-bottom category. However, there are no large differences in the proportion of households receiving remittances (transferred income) across expenditure categories (6-12%), except for the top income category, in which 25% of households are remittance recipients.

Table B.2a: Monthly household spending power, as measured by expenditure

Characteristic	All	Location		Household has…			Household head is[c]		Gender (Informal)		Value of transfer (row pct.)[d]
		Informal areas	Formal areas	Ten-ure[a]	Water connec-tion	A busi-ness[b]	Skilled	Un-skilled	Male-headed	Female-headed	
Percent of households below poverty line	68	77	68	69	47	62	64	70	78	77	
N	1,023	136	887	210	224	81	352	671	104	28	
Mean expenditure (monthly KSh)	12,570	10,569	12,642	14,022	21,559	19,825	15,340	11,386	11,341	7,898	
N	1,026	136	890	210	227	82	354	672	104	28	
Percent of households with expenditure:[d]											
Less than 3,000 KSh	3	2	3	1	1	1	1	4	2	2	0,939 (13%)
3,001-6,000 KSh	25	31	25	22	14	11	14	30	26	47	2,010 (23%)
6,001-9,000 KSh	21	19	21	17	12	7	23	20	20	17	3,033 (41%)
9,001-30,000 KSh	15	17	15	14	9	14	12	17	16	21	2,379 (41%)
13,001-18,000 KSh	15	17	15	17	15	20	18	14	19	6	3,607 (59%)
18,001-30,000 KSh	14	12	14	24	25	30	23	10	14	7	5,150 (61%)
31,001-75,000 KSh	6	2	6	4	22	16	8	4	3	0	8,799 (61%)
Above 75,000 KSh	0	0	0	0	1	1	0	0	0	0	66,000 (40%)
N	1,026	136	890	210	227	82	354	672	104	28	452
Cash transfers[e]	4,203	0	4,203	0	7,909	2,441	5,505	3,632	0	0	
N	109	6	103	21	31	9	22	87	1	5	

Notes:
a. Household possesses deed or other officially recognized document conferring ownership of the structure, land, or both.
b. "Business" refers to a self-employed activity that may or may not entail household or wage employees.
c. Includes those self-declared as "skilled" as well as "professional".
d. An imputed 30-day value from responses over several periods (7 days for food, 30 days for other consumables, 12 months for durables and annual services). See Volume I in the Overview Report. No significance test performed on this column.
e. Transfers are cash outflows over last three months averaged over households with such flows (equal to proportion of row households in parentheses).

Table B.2b: Monthly household spending power, as measured by income

Characteristic	All	Location		Household has…			Household head is[c]		Gender (Informal)		Value of remittance (row pct.)[e]
		Informal areas	Formal areas	Tenure[a]	Water conection	A busi-ness[b]	Skilled	Un-skilled	Male-headed	Female-headed	
Proportion of households with income:[d]											
Less than 3,000 KSh	10	8	10	13	0	0	**3**	**12**	**5**	**21**	2,023 (6%)
3,001-6,000 KSh	20	23	19	11	6	7	**14**	**22**	21	32	4,323 (8%)
6,001-9,000 KSh	24	27	24	26	19	10	**15**	**28**	30	13	5,140 (9%)
9,001-30,000 KSh	15	19	15	14	10	17	16	14	18	26	14,119 (13%)
13,001-18,000 KSh	13	16	13	18	12	22	**17**	**11**	18	8	8,199 (10%)
18,001-30,000 KSh	13	**5**	**14**	14	**31**	36	**25**	**8**	6	0	18,302 (12%)
31,001-75,000 KSh	4	1	4	4	**16**	7	**9**	**2**	2	0	143,135 (9%)
Above 75,000 KSh	1	0	1	**0**	5	1	1	1	0	0	67,782 (25%)
N	943	129	814	190	207	79	333	610	99	26	96
Cash remittances[e]	15,212	7,899	15,325	13,525	29,180	12,994	24,500	13,676	1,000	8,985	
N	109	6	103	21	31	9	22	87	1	5	

Notes:
a. *Household possesses deed or other officially recognized document conferring ownership of the structure, land, or both.*
b. *"Business" refers to a self-employed activity that may or may not entail household or wage employees.*
c. *Includes those self-declared as "skilled" as well as "professional".*
d. *Total household cash income in KSh, previous month, not including in-kind income or cash assistance from/to family or friends who live outside the household. No significance test performed on this column.*
e. *Remittances are cash inflows over last three months averaged over households with such flows (equal to proportion of row households in parentheses).*

B.3 Household Wealth Composition

The "household wealth index" is calculated from the household's declared ownership of a list of common household items. The value itself is created by totaling the estimated value of each item (indicated in brackets, in USD), converting to KSh, and dividing by 1,000; so the average of 20.8 means that the average household owned approximately 20,800 KSh worth of listed possessions. However, since each possible possession was only counted once, this should not be taken as a reliable estimate, but rather a unitless index of comparison.

This value is significantly higher in non-poor vs. poor households. There are significant differences by area type and gender of household head in the holdings of Class-3 durables. The significant differences between poor and non-poor households are found in Class-1, Class-2 and Class-3 durables, as well as entertainment equipment.

Home values are relatively concentrated. The high number of missing or don't know responses to this question means that the averages shown are drawn from a relatively small group and tests of statistical significance were not possible.

Table B.3: Household wealth composition

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Index of household wealth[a]	20.8	**16.8**	**20.9**	**16.9**	**29.1**	17.1	14.5
N	1,026	136	890	664	359	104	28
Household's average holdings of:							
Class-1 durables (furniture, pans, iron, mosquito net) [7]	5.1	5.0	5.1	**4.7**	**5.9**	5.1	4.7
Class-2 durables (stove, sewing machine, fan, wheelbarrow, water storage tank) [60]	0.8	0.7	0.8	**0.6**	**1.1**	0.6	0.7
Class-3 durables (refrigerator, washing machine, electric generator, bicycle) [100]	0.2	**0.1**	**0.2**	**0.1**	**0.3**	**0.1**	**0.0**
Farm animals (poultry and livestock) [200]	0.2	0.1	0.2	0.2	0.2	0.1	0.1
Entertainment equipment (radio, TV, satellite dish, DVD, video player) [80]	1.3	1.1	1.3	**1**	**1.9**	1.2	1.0
Motorized transport (motorcycle [400], car [1,000])	0.0	**0.0**	**0.0**	0.0	0.0	0.0	0.0
N	1,026	136	890	664	359	104	28
Value of primary residence, not its land (in 1,000 KSh)[b]	112	-	<u>112</u>	<u>47</u>	<u>1,000</u>	-	-
N	3	0	3	2	1	0	0
Value of primary residence and its land (in 1,000 KSh)[(b)]	4,787	<u>1,571</u>	<u>10,218</u>	<u>1,571</u>	<u>10,218</u>	<u>1,738</u>	<u>3,740</u>
N	106	21	85	55	51	18	3
Value of other land and/or residence (in 1,000 KSh)[c]	6,042	-	<u>6,042</u>	<u>211</u>	<u>9,804</u>	-	-
N	10	0	10	2	8	0	0

Notes:
a. This is a class-weighted average of the number of items as disaggregated in this same table, multiplied by the weight given within the square brackets [].
b. About 89% of the sample had missing values for this amount, though at about the same frequency across the categories of this table. About half the sample that declared owning land or a residence failed to report its value. Averages are only over households with the asset. See "Proportion of Owners" in Table C.1. Note that values in the last three rows of the table are divided by one thousand.
c. Since the survey does not ask the value of these, they have been imputed as a percent of primary residence value where it was declared (see Footnote (b)). These imputations are: land in city (10%), land outside city (5%), residence only in city (40%), and residence only outside of city (28%). If household has both land and structure these are scored separately and added together. In the case where the land of primary residence is not owned the value of the residence is first doubled before the imputations are made.

B.4 Household Finance

Only 37% of all households in Malindi have a bank account, with no significant differences across comparisons presented, except for poverty level; whereas 57% of non-poor households hold a bank account, only 28% of poor households have one. Furthermore, the percentage of households with loans is extremely low (not more than 10% all sources of loans altogether), and most loans (7%) are obtained from a relative or a friend. Consistent with findings mentioned above, far more households (37%) sent money to people not living in the household than received money from such people (12%). Significantly fewer poor households send money than non-poor households, and significantly more households in formal areas are remittances recipients. In informal areas, considerably more female-headed households receive remittances (21% vs. 1% of male-headed households).

Table B.4: Household finance

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with a bank account	37	36	37	**28**	**57**	36	35
N	1,025	136	889	664	358	104	28
Percent of households with a loan	9	6	10	**11**	**5**	4	9
N	1,024	136	888	663	358	104	28
Percent of households with a loan from a…							
Bank	1	0	1	1	1	0	0
Microfinance institution	1	1	1	1	1	1	0
Savings/credit group or co-op	1	1	1	1	2	1	0
Relative/friend	7	4	7	**9**	**2**	3	9
Informal lender	0	0	0	0	0	0	0
N	1,026	136	890	664	359	104	28
Percent of households receiving cash from those not now living at residence[a]	12	**5**	**12**	13	9	**1**	**21**
N	1,025	136	889	664	358	104	28
Percent of HHs sending cash to those not now living at residence[a]	37	40	37	**30**	**51**	42	30
N	1,024	136	888	663	358	104	28

Notes:
Over the previous twelve months.

B.5 Household-Owned Business Profile

Only 7% of households own a business, most of which (60%) engage in some form of selling. These businesses tend to be fairly new and quite small, as the average age for a business is less than a year and the average number of employees is between one and two—in fact, the business owner is the sole employee in many cases. Nearly all businesses are registered either with a local authority (48%) or not at all (50%), and 38% of businesses do not pay fees or taxes. Thirty-six percent of businesses pay a single-business permit local fee, 17% of them pay a daily market local fee, and only 12% pay taxes. However, the relatively low number of businesses means that it is not possible to perform tests of statistical significance for most of Table B.5.

Table B.5: Household-owned business profile

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with business ownership, last 12 months	7	7	7	6	8	6	6
N	1,026	136	890	664	359	104	28
Type of business:[a]							
Manufacturing	8	30	7	10	0	19	0
Selling	60	18	62	63	58	14	51
Transport	0	0	0	0	0	0	0
Professional (including Internet)	4	0	5	6	3	0	0
Other (barber, cleaning, etc.)	29	52	28	23	40	67	49
N	82	10	72	48	33	7	2
Years in operation	1.2	0.6	1.2	1.4	0.9	0.5	0.9
N	82	10	72	48	33	7	2
Number of employees	1.4	1.1	1.4	1.3	1.6	1.1	1.0
N	82	10	72	48	33	7	2
Which are…							
Household members	1.1	1.1	1.1	1.2	1.1	1.1	1.0
N	82	10	72	48	33	7	2
Non-household members	0.3	0	0.3	0.1	0.6	0	0
N	82	10	72	48	33	7	2
Revenue in previous month[b]	15,233	12,121	15,378	12,858	19,125	12,517	14,028
N	68	9	59	40	27	6	2
Registration status:							
Local authority (municipal or city council)	48	48	48	37	67	60	51
Kenya Revenue Authority	4	0	4	3	5	0	0
Registrar of Companies	2	0	2	0	5	0	0
None of the above	50	52	50	61	31	40	49
N	82	10	72	48	33	7	2
Share of businesses making fiscal contributions:							
Daily market local fee	17	22	16	16	19	33	0
Single business permit local fee	36	18	36	28	46	14	51
Value Added Tax	12	9	12	6	21	13	0
N	82	10	72	48	33	7	2

Notes:
   a.   Households were allowed to choose more than one category so these figures may exceed 100%.
   b.   Average over only those businesses operating over the period.

DWELLING TENURE, SECURITY, AND CHARACTERISTICS

C.1 Household Dwelling Characteristics

On average, households in Malindi have two people per room, a ratio that significantly differs by household poverty (2.2 people on average among poor households vs. 1.4 people per room among non-poor households). Households have less than one bathroom on average. Twenty percent of households have a kitchen. This proportion is higher among non-poor households (30%) than poor households (15%).

Most households in Malindi cook with charcoal, firewood or paraffin, or kerosene. In informal areas, a significantly higher percentage of households headed by females use paraffin or kerosene than those headed by males (41% vs. 15%). No other differences on fuel consumption proved statistically significant.

Most households are renters (66%), with only a small percentage (28%) owning their land and structure. There are no statistically significant differences across the categories used in this abstract, except for squatter households; 3% of poor households are squatters, while no non-poor households squat.

People in Malindi report they are highly susceptible to natural and manmade hazards. Fully, 86% of households report that the area around their dwelling floods during heavy rains, 54% indicate they have suffered of mudslides over their dwelling, 50% say they live within a ten-minute walk of a formal or informal garbage dump, and 11% state that they are exposed to factory pollution in their neighborhood. A significantly larger proportion of households located in informal areas lives near a garbage dump than those located in formal areas (64% vs. 49%). Interestingly, a larger proportion of non-poor households report this problem than poor households (62% vs. 45%). In addition, factory pollution is reported much more frequently in households located in formal areas (11%) than in informal areas (2%).

Quality of housing varies widely across location. Thirty-four percent of households in Malindi have an earth or clay floor. This dwelling characteristic varies by poverty level: while only 17% of non-poor households have earth or clay floor, 42% of poor households report having it. More than a half of households have an iron or grass roof (60%), though the proportions are significantly different in formal vs. informal areas and in poor vs. non-poor households. Only 65% of households have stone or brick walls; although the latter is more common among non-poor households (83%) than among poor households (57%).

Table C.1: Household dwelling characteristics

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Number of persons per room	2.0	2.2	2.0	**2.2**	**1.4**	2.3	1.9
N	1,026	136	890	664	359	104	28
Number of bathrooms	0.6	0.7	0.6	**0.5**	**0.9**	0.6	0.7
N	1,026	136	890	664	359	104	28
Proportion of residences with kitchen	20	13	20	**15**	**30**	14	9
N	1,025	136	889	664	358	104	28
Primary cooking fuel:							
Electricity	1	<u>1</u>	<u>1</u>	<u>0</u>	<u>2</u>	1	0
Paraffin or kerosene	15	<u>20</u>	<u>15</u>	<u>15</u>	<u>16</u>	**15**	**41**
Gas	8	<u>2</u>	<u>8</u>	<u>2</u>	<u>19</u>	3	0
Charcoal	51	<u>48</u>	<u>51</u>	<u>51</u>	<u>51</u>	53	34
Firewood	26	<u>29</u>	<u>25</u>	<u>32</u>	<u>11</u>	28	25
N	974	126	848	636	335	94	28
Proportion of households that:							
Total	100	100	100	100	100	100	100
Owns the land only	1	1	1	1	1	1	0
Owns structure only	3	3	3	3	1	4	0
Owns land and structure	28	31	28	29	29	31	27
Rents	66	64	66	65	69	63	73
Squats	2	1	2	**3**	**0**	1	0
N	1,026	136	890	664	359	104	28
Pct. of HHs in areas subject to[a]:							
Flooding[b]	86	87	86	85	89	91	78
Mudslides[c]	54	61	53	50	61	63	55
10 minute walk to formal or informal garbage dump	50	**64**	**49**	**45**	**62**	68	57
Factory pollution (air, water, noise)	11	**2**	**11**	10	12	1	6
N	1,026	136	890	664	359	104	28
Housing quality:							
Pct. with earth/clay floor	34	33	34	**42**	**17**	33	23
Percent with corrugated iron roof	59	**76**	**59**	**54**	**70**	75	85
Percent with grass roof	0	0	0	0	0	0	0
Percent with stone/brick/block walls	65	66	65	**57**	**83**	64	77
N	1,026	136	890	664	359	104	28

Notes:
a. *All data is self-reported, and therefore subjective.*
b. *Households reported that the area floods during heavy rains.*
c. *Households reported that they are located on a hillside that is subject to mudslides.*

C.2 Home and Land Ownership

Most households are renters (66%), with only a small percentage (28%) owning their land and structure. Eighty percent of households owning their structure reported feeling secure in their ownership. Most household owners (41%) reported having a freehold title for their land, while 42% reported no land possession documents whatsoever. One percent of households reported being evicted.

Table C.2: Household residence and land tenure

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households that:							
Total	100	100	100	100	100	100	100
Own the land only	1	1	1	1	1	1	0
Own structure only	3	3	3	3	1	4	0
Own land and structure	28	31	28	29	29	31	27
Rent	66	64	66	65	69	63	73
Squat	2	1	2	3	0	1	0
N	1,026	136	890	664	359	104	28
Percent of households that feel secure in ownership	80	72	81	79	82	68	89
N	210	41	169	133	77	31	7
Variability of households feeling secure[a]	0.01	0.06	0.01	0.05	0	0.03	-
N	210	41	169	133	77	31	7
Percent of households that experienced eviction	1	1	1	**2**	**0**	2	0
N	1,026	136	890	664	359	104	28
Proportion of household owners by type of land-possession document:							
Total	100	100	100	100	100	100	100
None	42	27	42	33	62	31	11
Freehold title	41	49	40	44	33	52	54
Temporary occupation license	5	19	5	7	1	17	35
Share certificate	5	0	5	7	2	0	0
Government certificate of title[b]	1	2	0	0	1	0	0
Letter from chief (provincial administration)	4	4	4	4	1	0	0
Other	3	0	3	4	1	0	0
N	237	44	193	156	81	34	7
Neighborhood mobility							
Years in dwelling	7.9	8.1	7.9	8.1	7.4	7.9	8.1
N	1,026	136	890	664	359	894	104
Years in neighborhood	8.9	8.7	8.9	9.2	8.3	8.9	8.7
N	1,026	136	890	664	359	104	28
Home loan payment as a percent of spending power[c]	10	-	10	6	21	-	-
N	3	0	3	2	1	0	0

Notes:
a. Computed as the intra-class correlation coefficient, where the "class" is the EA. This measures the extent to which households within an EA resemble each other in their feelings of security in ownership. No significance tests performed on this row.
b. Long-term lease from City council/Government.
c. Computed only for those with a housing loan.

The bottom portion of Table C.2 focuses on neighborhood mobility. Households reported living an average of 7.9 years in their present dwelling, and about 8.9 years longer in their present neighborhood. On average, home loan payments represent 10% of spending power.

C.3 Distribution of Housing Values and Rents

Most respondents (73%) reported their home values to be between 9,000 KSh and 2.5 million KSh, but 28% of them reported home values in the range between 2.5 and 7 million KSh. The average value was about 4.5 million. Note that very few households – 109 in total – reported home values, and that there not enough observations per enumeration area across ranges and categories to perform significance tests, so these results are likely unreliable.

Average rent is 2,383 KSh per month. Also, a low number of observations of owner households did not allow their statistical significance to be tested.

Table C.3: Distribution of housing values and rents

Characteristic	All	Location		Household has...			Household head is...[c]		Gender (Informal)	
		Informal areas	Formal areas	Tenure	Water connection	A business	Skilled	Un-skilled	Male-headed	Female-headed
Average home value (1,000 KSh) [a]	4,488	2,005	4582	4,787	13,285	3286	5192	4,265	1,738	3,740
N	109	21	88	106	19	21	31	78	18	3
Distribution of home values: Total	100	100	100	100	100	100	100	100	100	100
1-8,999 KSh	0	0	0	0	0	0	0	0	0	0
9,000-299,999 KSh	18	19	18	13	12	0	10	20	21	0
300,000-999,999 KSh	20	9	20	21	0	15	8	23	5	32
1,000,000-2,499,999 KSh	35	45	34	36	41	32	35	35	46	36
2,500,000-250,000,000 KSh	28	28	28	30	48	53	47	22	27	32
N	109	21	88	106	19	21	31	78	18	3
Average monthly rent (tenants)[b]	2,383	1,308	2,420		6,523	2,751	3,033	2,022	1,387	1,124
N	744	86	658		168	52	287	457	64	21
Distribution of monthly rents: Total	100	100	100		100	100	100	100	100	100
1-899 KSh	35	31	35		7	22	17	45	28	36
900-1,499 KSh	16	34	16		3	17	13	18	35	33
1,500-1,999 KSh	14	17	14		7	10	18	12	17	20
2,000-3,499 KSh	19	17	19		23	26	26	15	19	12
3,500-150,000 KSh	16	1	16		60	24	26	10	1	0
N	744	86	658		168	52	287	457	64	21

Notes:
   a.   *Self-reported, current, monthly, fair-market price (response to the question, "If you were to sell your house, how much do you think you could sell it for?").*
   b.   *Excludes imputed owner-occupied rents.*
   c.   *Includes those self-declared as "skilled" as well as "professional".*

C.4 Neighborhood Social Capital and Civic Participation

Respondents that own their homes are more likely than renters to participate in their community. Ten percent of owners attended local councils (compared to only 4% of renters) and 28% attended neighborhood forums (compared to 10% of renters); both proportions are significantly higher than the corresponding proportion of renters. Owners were also more likely to have voted in 2007 general elections (57% vs. only 27% of renters), and to have participated in the 2010 referendum (52% vs. 28% of renters). These differences are statistically significant.

About 38% of respondents reported that they had an informal community or neighborhood leader. This characteristic significantly varied across household type of settlement, access to infrastructure and tenure. Households in informal areas, households in the bottom half of infrastructure access and those who are owners are considerably more likely to report having an informal local leader than households in formal areas, with a better access to infrastructure and renters. Very few respondents (1%) said that they had participated in a public demonstration or protest.

The survey asked respondents whether people in their neighborhood would cooperate if asked by an official to conserve water or electricity because of an emergency, and whether people in their neighborhood look out for each other. On both questions, the results were positive. When asked if people in their community would cooperate if asked by an official, the results averaged 3.6 on a four-point scale (where 4="very likely" and 1="very unlikely" to cooperate). When respondents were asked if they agreed that people look out and trust each other in their neighborhood, answers averaged 4.2 on a five-point scale (where 1="strongly disagree" and 5="strongly agree"). There were not statistically significant differences across categories in either question. Sixty-eight percent of respondents said they felt safe in their own neighborhood with no statistically significant differences across categories.

Table C.4a: Neighborhood social capital and civic participation

Characteristic	All	Location		Access to infrastructure[a]		Gender (Informal)		Tenure[b]	
		Informal areas	Formal areas	Lower half	Upper half	Male-headed	Female-headed	Own	Rent
Civic participation									
Percent of households... contacting local council	6	4	6	6	5	3	6	**10**	**4**
N	1,026	136	890	775	251	104	28	223	803
attending a neighborhood forum	16	**28**	**15**	17	11	28	29	**28**	**10**
N	1,026	136	890	775	251	104	28	223	803
Social activism									
Percent of households voting in...local election[c]	16	12	16	16	16	12	12	20	14
N	1,026	136	890	775	251	104	28	223	803
2007 general election[c]	36	34	36	**34**	**44**	38	22	**57**	**27**
N	1,026	136	890	775	251	104	28	223	803
2010 referendum[c]	35	38	35	33	43	41	28	**52**	**28**
N	1,026	136	890	775	251	104	28	223	803
Percent of households with informal community or neighborhood leader	38	**52**	**37**	**42**	**22**	56	38	**51**	**32**
N	1,024	136	888	775	249	104	28	223	801
Percent of households that took part in a public demonstration or protest	1	0	1	1	1	0	0	2	0
N	1,026	136	890	775	251	104	28	223	803

Notes:;
a. Defined by dividing the population in half based on a score assigned using responses from thirteen infrastructure-related questions (see Section 3 of Introduction.)
b. Alternatively, this could be the length of time living in the neighborhood: less/more than (say) 2 years.
c. Out of all households and not just those registered to vote.

Table C.4b: Neighborhood social capital and civic participation

Characteristic	All	Location		Access to infrastructure[a]		Gender (Informal)		Tenure(b)	
		Infor-mal areas	Formal areas	Lower half	Upper half	Male-headed	Fe-male-headed	Own	Rent
Social capital									
Average house hold response to:									
People in my neighborhood cooperate if asked by an official[c]	3.6	3.6	3.6	3.6	3.7	3.6	3.6	3.7	3.6
N	1,017	136	881	774	243	104	28	220	797
People in my neighborhood look out for/trust each other[d]	4.2	4.3	4.2	4.3	4.2	4.3	4.2	4.4	4.1
N	1,024	136	888	775	249	104	28	222	802
Proportion of HHs feeling safe from crime in own neighborhood	68	66	68	67	69	68	68	64	69
N	1,026	136	890	775	251	104	28	223	803

Notes:
a. Defined by assigning scores using responses from thirteen infrastructure-related questions.
b. Alternatively, this could be the length of time living in the neighborhood: less/more than (say) 2 years.
c. Four-point scale where 1="Very unlikely" to 5="Very likely".
d. Five-point scale where 1="Strongly disagree" to 5="Strongly agree".

D.1a Water Access

Twenty percent of households have a private piped water connection in their dwelling, a proportion which is significantly higher in formal areas (21%) than in informal areas (6%), and among non-poor households (34%) than among poor ones (14%). This asset also significantly varies by respondents security in their home ownership, where "secure" represents owners who feel no one could force them to leave without an official legal process in which they would participate, "insecure" represents owners who feel they could be forced out, and "rent" represents those who rent their homes and therefore have no security of ownership as well as squatters and those who own their dwelling but not land. On average, only two percent of households that say they feel insecure of their property have a private piped water connection inside their dwelling, whereas 27% of respondents that reported they feel secure have private pipe water connections. Thirty-one percent of households have a piped water connection in their compounds. Finally, 84% of households are close (within 50 meters) to a source of piped water. On average, it takes respondents over one hour a day to obtain water, including travel to and from the water source, waiting time, and filling time. Water costs an average of 484 KSh a month. Although there was not enough data at the census tract level to test for statistically significant differences between most categories of households for the cost of water in time or money, female-headed households spend, on average, significantly less time and money in water collection than male-headed households.

Twenty percent of respondents report that piped water is their most important water source. A considerably larger proportion of households in formal areas, non-poor households, those that say they feel secure of their ownership and renters considered piped water their primary source of water, compared to households in informal areas, poor households, and those that refer insecure conditions of ownership. Most respondents (59%) of households name water vendors as their most important water source. Considerably more poor households use vendors as their primary water source than non-poor households (66% vs. 44%). Another 21% of respondents declare they share tap connections. Non-poor households are more likely than poor households to obtain water from shared tap connections (52% vs. 40%), and are less likely to use water vendors (10% vs. 17%); both differences are statistically significant. As said, piped water services are considerably more common in formal areas than in informal settlements and among non-poor households than among the poor ones. Of the households that didn't have access to piped water, the main reason given (39%) was because they rented rather than owned their home and their landlord would not pay for a connection; the second most common reason (21%) was inability to afford the initial connection. Nineteen percent of respondents reported they had other sources available, and only two percent said that the water provider had a waiting list.

Table D.1a: Water access

Characteristic	All	Security of ownership[a]			Location			Household poverty		Gender (Informal)	
		Secure	Insecure	Rent	Informal areas	Formal areas		Poor	Non-poor	Male-headed	Female-headed
Percent of households with private piped water connection inside dwelling	20	27	2	20	**6**	**21**		**14**	**34**	6	3
N	1026	159	50	816	136	890		664	359	104	28
Percent of households with piped water connection in compound	31	39	5	30	28	31		30	32	29	26
N	1,026	159	50	816	136	890		664	359	104	28
Percent of households close to piped water access[b]	84	<u>84</u>	<u>77</u>	<u>85</u>	<u>88</u>	<u>84</u>		<u>81</u>	<u>94</u>	90	85
N	581	88	43	450	95	486		444	137	71	21
Monthly cost of water in …Time (minutes)[c]	413	<u>680</u>	<u>408</u>	<u>336</u>	<u>379</u>	<u>414</u>		<u>410</u>	<u>423</u>	**402**	**284**
N	584	90	43	451	96	488		446	138	72	21
Money (KSh)	484	<u>590</u>	<u>816</u>	<u>406</u>	<u>424</u>	<u>486</u>		<u>473</u>	<u>511</u>	**454**	**278**
N	852	158	49	644	120	732		582	269	90	26
Most important water source: Total	100	100	100	100	100	100		100	100	100	100
Piped	20	27	2	19	**6**	**20**		**13**	**32**	6	3
Bottled	0	0	0	0	0	0		0	1	0	0
Shared tap connection	21	21	5	22	24	21		21	22	25	24
Vendor (kiosk, tanker, other)	59	51	94	59	69	59		**66**	**44**	67	74
Neighbor(s)	0	0	0	0	**1**	**0**		0	0	1	0
Well/borehole	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>		<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Natural source outside household	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>		<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
N	1,026	159	50	816	136	890		664	359	104	28
No connection due to:	100	100	100	100	100	100		100	100	100	100
Other sources available	19	<u>2</u>	<u>20</u>	<u>24</u>	<u>11</u>	<u>19</u>		<u>24</u>	<u>4</u>	7	16
Renting[d]	39	<u>0</u>	<u>2</u>	<u>55</u>	<u>42</u>	<u>39</u>		<u>39</u>	<u>38</u>	40	52
Can't afford connection	21	<u>39</u>	<u>72</u>	<u>9</u>	<u>24</u>	<u>20</u>		<u>15</u>	<u>40</u>	25	19
Can't afford monthly bill	19	<u>52</u>	<u>4</u>	<u>11</u>	<u>14</u>	<u>19</u>		<u>20</u>	<u>16</u>	**19**	**0**
Provider has waiting list	2	<u>4</u>	<u>3</u>	<u>1</u>	<u>7</u>	<u>2</u>		<u>2</u>	<u>2</u>	6	12
No service available	1	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>		<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>
Other	0	1	0	0	2	0		0	0	2	0
N	581	88	43	450	95	486		444	137	71	21

Notes:
a. Self-reported; "secure" includes owners who feel no one could force them to leave without an official legal process in which they would participate, "insecure" includes owners who feel they could be forced to leave without an official legal process, and "rent" includes renters, squatters, and people who own their structure but not land.
b. Respondents were asked whether there were dwellings or businesses within 50 meters of their home that had a piped water connection in the dwelling or compound.
c. Calculated as the sum of time spent travelling, waiting in line, and filling containers.
d. House does not have a connection and landlord will not pay for one.

D.1b Water Quality

Water quality is generally rated "good" or "fair," although 36% of the households that obtain water from a shared tap connection and 37% using other vendors rate their water quality to be fair or poor.

Almost all respondents purchase their water from a public utility (99%). Only 13% of the households in Malindi treat their water in any way; of those that treat water, most boil it (23%) or add bleach or chlorine (20%). A considerably significantly more households above the poverty line, in formal areas, and with good quality water said that they treat water (compared to poor households, those located in informal areas, and those with poor water quality).

Table D.1b: Water quality

Characteristic	All	Household poverty		Location		Water quality					Gender (Informal)	
		Poor	Non-poor	Informal areas	Formal areas	Good	Fair	Poor	Total	N	Male-headed	Female-headed
Water source:[a] Piped	20	**13**	**32**	**6**	**20**	88	12	0	100	216	6	3
Bottled	0	**0**	**1**	0	0	100	0	0	100	5	0	0
Shared tap connection	21	21	22	24	21	64	34	2	100	222	25	24
Other vendor	59	**66**	**44**	69	59	63	31	6	100	580	67	74
Neighbor(s)	0	0	0	**1**	**0**	28	72	0	100	2	1	0
Well/Borehole	0	0	0	0	0	-	-	-	100	0	0	0
Natural outside-household source	0	0	0	0	0	-	-	-	100	0	0	0
N	1,026	664	359	136	890	707	279	39			104	28
Water provider: Public	100	100	99	100	100	76	23	1	100	442	100	100
Private	0	0	0	0	0	0	100	0	100	1	0	0
Self	0	0	0	0	0	0	100	0	100	1	0	0
Community	0	0	0	0	0	-	-	-	100	0	0	0
N	445	220	222	41	404	333	105	6			33	7
Percent of households treating drinking water	13	**11**	**17**	**6**	**13**	**52**	38	10	100	158	4	13
N	1,026	664	359	136	890	707	279	39			104	28
Treatment method:[b] Boiling	23	13	36	0	23	43	35	22	100	37	0	0
Add bleach/chlorine	20	89	69	89	80	49	40	11	100	121	4	3
Other (sieve, filter, settle)	6	2	13	11	6	83	15	3	100	14	23	0
N	158	81	74	7	151	88	58	12			4	3

Notes:
a. Most important water source.
b. Since multiple responses were permitted, the sum can exceed 100%. Likewise, "Other" is not shown, since it was negligible, so the sum may also be less than 100%.

D.2a Electricity and Waste-Disposal Services

Only 39% of respondents reported access to electricity, a figure that differs significantly by poverty level (58% of non-poor vs. 29% poor). Reasons for not having a connection are similar to those for water – the primary reason reported was that households did not own their home and didn't have a choice (43%), followed by inability to pay for the initial connection (41%). Less than one percent of respondents reported functional street lighting in their area, and those households are concentrated among the non-poor ones.

The average monthly bill for those with electricity is 704 KSh a month. Five percent of households with electricity do not pay for it. Among those households that pay, electricity payments are primarily made to the public utility (73%), although some respondents pay their landlord instead (26%). Even when electricity is available, it is not particularly reliable; 67% of respondents experience outages on a weekly basis or more.

Slightly more than a half of all households reported getting rid of their refuse by dumping it in their neighborhood or compound, followed by 34% that burn their refuse. Burning is significantly more common among poor households than non-poor households (37% vs. 26%), and among informal areas than formal areas (51% vs. 33%).

Households in formal settlements and non-poor households are considerably more likely to use a garbage collection system than households in informal settlements and poor households. In general, eighty-three percent of households say they pay for collection service.

Table D.2a: Access to electricity and waste-disposal

Characteristic	All	Location		HH poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Electricity							
Proportion of households with access to electricity	39	39	39	**29**	**58**	42	32
N	1,026	136	890	664	359	104	28
Reason for no connection: Total	100	100	100	100	100	100	100
Renters	43	<u>43</u>	<u>43</u>	<u>45</u>	<u>37</u>	42	50
Firm has waiting list	2	<u>0</u>	<u>2</u>	<u>3</u>	<u>1</u>	0	0
Cannot afford connection	41	<u>45</u>	<u>41</u>	<u>39</u>	<u>51</u>	46	43
Cannot afford monthly bill	13	<u>12</u>	<u>13</u>	<u>14</u>	<u>11</u>	12	7
Other	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
N	513	83	430	396	117	60	20
Percent of households with mostly functioning street lighting	0	0	0	**0**	**1**	0	0
N	1,026	136	890	664	359	104	28
Average monthly bill, KShs	704	<u>802</u>	<u>700</u>	<u>566</u>	<u>862</u>	<u>893</u>	<u>258</u>
N	1,026	136	890	664	359	104	28
Percent of households not paying for electricity	5	3	5	7	2	4	0
N	340	32	308	187	152	26	5
Payment to: Total	100	100	100	100	100	100	100
Utility	73	<u>64</u>	<u>73</u>	<u>61</u>	<u>86</u>	<u>65</u>	<u>52</u>
Prepaid card	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Landlord	26	<u>36</u>	<u>25</u>	<u>39</u>	<u>11</u>	<u>35</u>	<u>48</u>
Third party (from utility power line)	0	0	0	0	0	0	0
N	327	31	296	176	150	25	5
Percent of households with outages at least once weekly	67	<u>67</u>	<u>67</u>	<u>69</u>	<u>64</u>	<u>67</u>	<u>69</u>
N	513	53	460	268	242	44	8
Refuse disposal							
Main method:							
Dumping	51	47	51	52	49	42	59
Burying	2	3	2	2	2	3	3
Burning	34	**51**	**33**	**37**	**26**	56	39
Collection system[a]	14	**0**	**14**	**9**	**23**	0	0
N	1,026	136	890	664	359	104	28
Proportion of households paying for collection	83	-	<u>83</u>	<u>84</u>	<u>82</u>	-	-
N	192	0	192	88	101	0	0

Notes:
Run by city, community, or private firm.

D.2b Access to Sanitation Services

Only 14% of households reported that they have a toilet in their home, and this significantly varies by location and poverty level. Whereas 15% of households in formal areas have a toilet at home, only 5% of those in informal settlements have one, and 32% of non-poor households report having a toilet compared to just 6% of poor households. Most households use a public shared latrine (41%), a pit latrine (28%), or a flush toilet (24%). Households in formal settlements are much more likely to use a flush toilet and less likely to use a pit latrine. The majority of households (81%) share a toilet with several other families. Compared to households in informal areas, significantly more households in formal areas do not share toilets at all, while significantly fewer share with 10 or more other households. Most toilets (76%) drain into pits, 19% report their toilets are connected to septic tanks or soak pits, and only 4% of respondents use toilets connected to a sewage system.

Table D.2b: Access to sanitation

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with toilet in home	14	**5**	**15**	**6**	**32**	6	0
N	1,026	136	890	664	359	104	28
Type of toilet system: Total							
Pit latrine (individual)	28	23	28	**34**	**15**	23	21
VIP latrine	0	0	0	1	0	0	0
Flush toilet/WC	25	26	25	**17**	**42**	29	20
Public/shared latrine	41	45	40	41	40	43	56
Paid shared latrine	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
N	1,026	136	890	664	359	104	28
Percent of households sharing toilet:							
Doesn't share	19	13	19	**12**	**33**	15	6
Shares with 2-9 other households	77	81	77	**83**	**64**	80	85
Shares with 10+ other households	4	6	4	5	2	5	9
N	993	130	863	636	354	99	27
Type of disposal system for toilet:							
Total	100	100	100	100	100	100	100
Pit latrine	76	76	76	**82**	**64**	78	70
Sewer (legal)	4	2	4	3	6	<u>1</u>	<u>7</u>
Sewer (informal)	0	0	0	0	0	0	0
Septic tank/soak pit	19	21	19	**13**	**30**	21	23
N	928	117	811	588	337	90	24
Disposal of "grey water": Total							
Total	100	100	100	100	100	100	100
Dump into drain	44	**33**	**44**	43	46	31	40
Pour onto road	55	**67**	**55**	56	53	69	58
Pour into latrine	1	1	1	1	1	0	3
Other	0	0	0	0	0	0	0
N	1,025	135	890	663	359	104	27

"Grey water" (waste water from washing, cleaning, etc.) is generally poured out into the road (55%) or dumped down the drain (44%). Households in formal settlements are more likely to dump their grey water down the drain (44%) than pour it into the street (55%), whereas households in informal areas are less likely to dump them into the drain (33%) and more likely to pour grey water down into the street (67%).

D.3 Access to Transport

Most individuals (57%) work or study outside their neighborhood rather than inside. Individuals from households in informal areas are more likely to work or study outside their neighborhood than those in formal areas. Most respondents commute on foot (80%) or via a bike tax (11%). Matatus[14] only represent the main mode of travel for 4% of household members. Students and people in informal areas are significantly more likely to walk than workers and people in formal areas, and typically less likely to use a bike taxi or a matatu.

Table D.3: Access to transport

Characteristic	All	Household activity[a]		Location		Household poverty		Gender (Informal)	
		Work	Study	Informal areas	Formal areas	Poor	Non-poor	Male-headed	Fe-male-headed
Percent who work or study…									
inside the neighborhood	36			**48**	**35**	43	18	43	60
outside the neighborhood	57			49	58	55	63	54	34
inside and outside the neighborhood	7			3	7	2	19	3	6
N	1,217			164	1,053	820	391	132	27
Main mode of travel[b] Walk	80	**81**	**100**	**89**	**80**	83	73	88	93
Bicycle	3	**2**	**0**	1	3	3	4	2	0
Own vehicle	0	0	0	0	0	0	1	0	0
Matatu	3	**3**	**0**	2	3	1	7	2	0
Shared taxi	0	0	0	0	0	0	0	0	0
Bike taxi	11	14	0	7	11	10	13	8	7
Municipal bus	0	0	0	0	0	0	1	0	0
N	1,825	148	112	260	1,565	1,286	533	208	44
Transport time (minutes)	18	**16**	**12**	**14**	**18**	17	20	15	13
N	1,819	148	112	260	1559	1286	527	208	44
One-way trip cost to work/school (KSh)	70	55	-	55	71	58	90	51	50
N	333	28	0	28	305	191	139	23	4
Households with road access as: Poor	51			56	51	**47**	**62**	60	45
Good	49			44	49	53	38	40	55
N	1,026			136	890	664	359	104	28
Percent of households with limited road access during rainy season	6			3	6	5	7	4	0
N	1,026			136	890	664	359	104	28

Notes:
a.   Informal areas only.
b.   To work or to school. May not add to 100% since "Other", which was negligible, is not reported in table.

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[14] A "matatu" is a 14-seater minivan used throughout Kenya as a form of public transport.

Average one-way transport time is 18 minutes. Respondents take slightly longer trips to work than to school. Of the respondents that had to pay to travel, the average one-way cost is 70 KSh.

Forty-nine percent of respondents said that their access to roads is generally good but 51% said it is poor. Considerably more respondents from non-poor households think road access are poor than respondents from poor households and inversely, respondent from poor households are more likely to consider their road access good compared to non-poor respondents. Six percent of households have limited road access during the rainy season.

D.4 Access to Communications

While land lines are practically nonexistent among households in Malindi, mobile phone ownership is widespread. The average household owns one mobile phone, and this distribution is quite even across area types, poverty levels and genders of the household head. A remarkably large number of those with mobile phones use mobile banking (64%). In addition, very few respondents have a computer (1%), though the rate of computer ownership is significantly higher among non-poor households than among poor households (4% vs. 0%). Only 7% reported accessing the internet using any means, a figure which is significantly higher among non-poor households than among poor households (11% vs. 5%).

Table D.4: Access to communications

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with functioning land line	0	1	0	**0**	**1**	2	0
N	1,026	136	890	664	359	104	28
Average number of mobile phones owned by household	1.0	1.0	1.0	1.0	1.1	1.1	0.8
N	1,026	136	890	664	359	104	28
Percent of households using mobile banking	64	72	64	62	67	74	66
N	1,026	136	890	664	359	104	28
Percent of households with functioning computer	1	0	1	**0**	**4**	0	0
N	1,026	136	890	664	359	104	28
Percent of households using internet (any means)	7	10	7	**5**	**11**	11	7
N	1,026	136	890	664	359	104	28

D.5 Access to Infrastructure Indicator

The access to infrastructure indicator combines six categories of infrastructure (divided into 13 subcategories) weighted by importance to the household and summed to create a household indicator from 0 to 9.5.[15] Higher scores represent better access to infrastructure. This indicator provides an overall understanding of a household's infrastructure access. By averaging households' scores on the indicator, we can quickly compare infrastructure access in informal and formal areas, between poor and non-poor households, and between male- and female-headed households in informal areas.

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[15] The 13 subcategories are: piped water (1 point); shared/indirect connection (0.5 points); direct electricity access (1); street lighting (0.5); garbage collection system (1); own toilet (1); shared toilet with less than 20 other people (0.5); legal sewer system for toilet (0.5); grey water not poured onto street (0.5); good road access at dwelling (0.5); road access not limited during rainy season (0.5); no flooding (1); no mudslides (1).

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Table D.5 presents household mean scores on the access-to-infrastructure indicator. The mean score across all households in Malindi is 2.51. Households in formal areas score significantly higher than households in informal areas. There are also significant differences between poor and non-poor households (2.99 vs. 2.28).

Table D.5: Access to Infrastructure Indicator

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Mean score on access to infrastructure indicator	2.51	**2.15**	**2.53**	**2.28**	**2.99**	2.11	2.23
N	1,026	136	890	664	359	104	28

CONCLUSIONS

The following three figures are "Development Polygons". These polygons are meant to complement the detailed tables presented in sections A through D by illustrating an "overall" sense of the state of the city. We present information for all areas, along with formal and informal areas, in each of the three figures: the Development Diamond, the Infrastructure Polygon, and the Living Conditions Diamond.[16] In all figures, the value labels included provide the value of the indicator for all areas. The statistics underlying these figures are also in the tables, above. Similar graphics also appear in the City-at-a-Glance Reports and the Overview Report produced under the NORC contract.

The axes for all figures represent percentages. Polygons with larger areas represent "better" situation in regards to the associated indicator(s). Hence, a polygon with full coverage would indicate that the city is doing very well in terms of development, infrastructure, or living conditions.

The Development Diamond (Figure 1) maps four indicators of poverty – welfare, employment, education, and living conditions. In three quarters of the development diamond – welfare, employment, and education – formal and informal areas are similarly situated. However, households in formal areas outpace the households in informal areas in terms of living conditions – in formal areas, a larger percentage of households have permanent walls and access to both piped water and electricity (16% vs. 4% in informal areas and 15% overall).

The Infrastructure Polygon, shown in Figure 2, presents residents' access to ten different types of infrastructure -piped water, electricity, private toilets, sewage, drainage, garbage collection, street lighting, mobile phones, public transport, and good roads. Piped water is much more prevalent in formal areas than informal areas (41% and 30%). Electricity covers about 39% of households both in formal and informal areas. Private toilets are much less common overall, but we still find large differences by area type – only 4% of households in informal areas, compared to 14% in formal areas, have a private toilet. Sewage

Figure 1: Development diamond
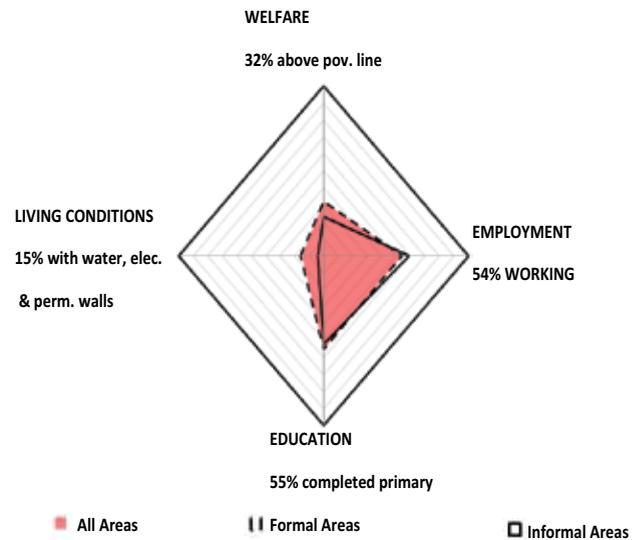
Figure 2: Infrastructure polygon

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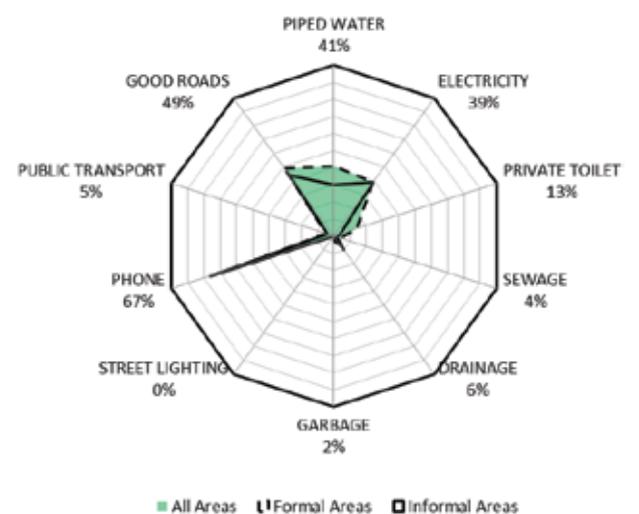
[16] The basic format for all three figures appear in the World Bank Policy Research Working Paper, "Poverty, Living Conditions, and Infrastructure Access" A Comparison of Slums in Dakar, Johannesburg, and Nairobi" by Sumila Gulyani, Debabrata Talukdar, and Darby Jack (2010). We strived to make our own figures as similar as possible, though some deviations, noted in the accompanying text, were necessary.

systems are even scarcer than toilets, both in formal and informal areas (only 4%). Ten percent of all households or less have drainage, and less than 2% of all households have garbage collection, all of them concentrated in formal areas. There are no reports of street lighting in Malindi. Mobile phone usage is quite common, as 66% of households in informal areas and 76% of households in formal areas own one or more mobile phones. Only 5% of all households report using public transport, and slightly less than a half report good roads (49%).

Figure 3: Living conditions diamond
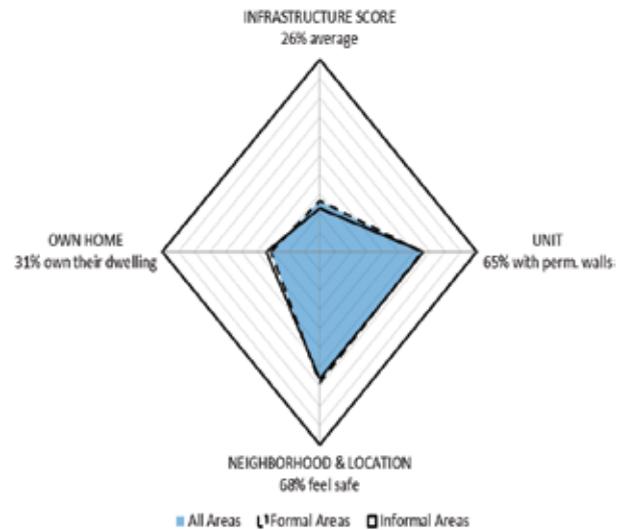
Figure 3 presents the Living Conditions Diamond. The four axes of this diamond are the infrastructure score (scaled to a percentage), unit conditions, neighborhood and location, and home ownership. All four indicators have similar coverage in informal and formal areas. However, only two—unit, and neighborhood and location-cover more than 50% of all households. Only 31% of households have permanent walls, and the average infrastructure score for all households in Malindi is 26% (slightly lower in informal areas than in formal areas).

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